

## Four new species of *Homoneura* s. str. from Yunnan, China (Diptera, Lauxaniidae)

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**Four new species of *Homoneura* s. str. from Yunnan, China (Diptera, Lauxaniidae).** - Four species of *Homoneura* s. str. from Yunnan, China are described as new to science: *H. cangshanensis* sp. n., *H. crispa* sp. n., *H. semiannulata* sp. n. and *H. trisurstylata* sp. n.

**Keywords:** Diptera - Lauxaniidae - *Homoneura* s. str. - new species - Yunnan.

### INTRODUCTION

The genus *Homoneura* van der Wulp in the family Lauxaniidae contains 8 subgenera and more than 600 species in the world. The subgenus *Homoneura* van der Wulp is the largest subgenus, including more than 500 known species in the world and more than 100 known species in China (Shi & Yang 2009; Wang, Gao & Yang 2012; Li & Yang 2012). It can be easily separated from other subgenera of the genus *Homoneura* by the following characters: mesoscutum with anterior supra-alar bristle and intra-alar bristle absent; fore tibia not compressed in male, mid tibia usually with 2-3 posterior ventral bristles, posterior dorsal bristle absent; hind tarsomere 2 not distinctly darkened; wing with costal setulae ending abruptly at tip of R<sub>4+5</sub>, apical section of M<sub>1+2</sub> not curved forward (Shi & Yang 2009). In the present paper, 4 new species are added to the fauna of Yunnan.

### MATERIAL AND METHODS

Genitalia preparations were made by removing and macerating the apical portion of the abdomen in cold saturated NaOH for 6-10 hours, acidify the preparations with glacial acetic acid in water. After examination, they were transferred to fresh glycerine and stored in a microvial on the pin below the specimen. Specimens examined were deposited in the Entomological Museum of China Agricultural University (CAU), Beijing and in the Natural History Museum of Geneva, Switzerland (MHNG). The general terminology follows McAlpine (1981) and Shewell (1987). The following abbreviations for bristles are used: a = anterior, acr = acrostichal, ad = anterior dorsal, anepst = anepisternal, apv = apical ventral, av = anterior ventral, dc = dorsocentral, kepst = katepisternal, oc = ocellar, or = fronto-orbital, pd = posterior dorsal, prsc = prescutellar, pv = posterior ventral.

## TAXONOMIC PART

***Homoneura cangshanensis* new spec.**

Figs 1-10

MATERIAL: Holotype ♂ (CAU), CHINA, Yunnan Province: Dali, Cangshan, Wuweisi (25°43'N, 100°07'E, 2200 m), 30. VII. 2006, Kuiyan Zhang. – Paratypes: CHINA, Yunnan Province: 1 ♀ (CAU), data same as holotype. – 1 ♀ (MNHG), Dali, Cangshan, Wuweisi (25°43'N, 100°07'E, 2200 m), 1. VIII. 2006, Kuiyan Zhang.

ETYMOLOGY: The new species is named after the type locality Cangshan.

DIAGNOSIS: Antennal arista long plumose, with longest hairs as long as height of 1st flagellomere. Wing with 5 brown spots, separately on r-m, dm-cu, and preapices of  $R_{2+3}$ ,  $R_{4+5}$ ,  $M_1$ , preapical spot of  $M_1$  obscure. Abdominal tergites 2-5 somewhat irregular brownish yellow at anterior margin; protandrium incompletely circular; surstylus claviform, curved backward and acute apically; aedeagus with pair of dorsal sclerites incurved and convergent apically.

## DESCRIPTION

*Male*: Body length 4.1 mm, wing length 4.7 mm. *Female*: Body length 4.8-4.9 mm, wing length 5.1-5.2 mm.

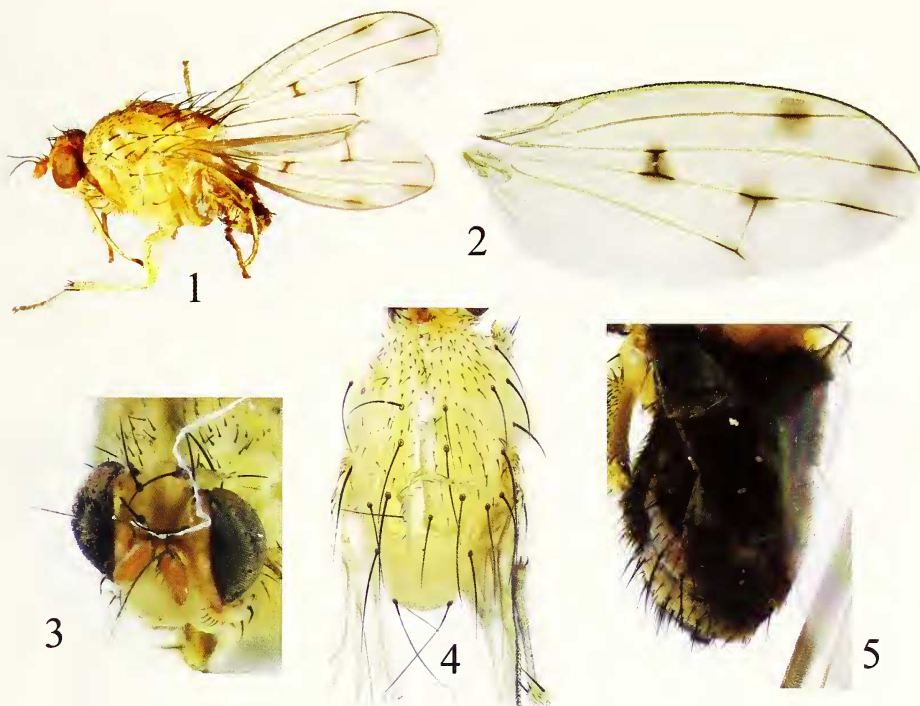
Head (Fig. 3) yellow. Frons slightly wider than long and parallel-sided; ocellar triangle brown; oc strong, about as long as anterior or, anterior or shorter than posterior or. Gena about 1/6 height of eye. Antenna yellow, 1st flagellomere brownish, 1.3 times longer than high; arista long plumose, blackish brown except brown basally, with longest hairs as long as height of 1st flagellomere. Proboscis yellowish brown, with yellowish and blackish hairs; palpus pale yellow with blackish hairs.

Thorax (Fig. 4) yellow with grayish white pruinescence. Mesoscutum with 0+3 dc, anterior dc clearly behind transverse scutal suture, acr in 6 somewhat irregular rows. prsc somewhat shorter than 1st post-sutural dc. Legs pale yellow. Fore femur with 4 strong pv and 5 pd, ctenidium with 11-12 short bristles; fore tibia with 1 long preapical ad and 1 short apv. Mid femur with 4 a and 1 apv; mid tibia with 1 strong preapical ad and 3 strong apv. Hind femur with 1 preapical ad; hind tibia with 1 weak preapical ad and 1 short apv. Wing (Fig. 2) slightly yellow, with 5 brown spots, separately on r-m, dm-cu, and preapices of  $R_{2+3}$ ,  $R_{4+5}$ ,  $M_1$ , preapical spot of  $M_1$  obscure; subcostal cell hyaline; costa with 2nd (between  $R_1$  and  $R_{2+3}$ ), 3rd (between  $R_{2+3}$  and  $R_{4+5}$ ) and 4th (between  $R_{4+5}$  and  $M_1$ ) sections in proportion of 2.5 : 0.8 : 0.5; r-m beyond middle of discal cell; ultimate and penultimate sections of  $M_1$  in proportion of 1.5 : 1.0; ultimate section of  $CuA_1$  about 1/7 of penultimate. Halter pale yellow.

Abdomen (Fig. 5) yellow; tergites 2-5 somewhat irregular brownish yellow at anterior margin. Male genitalia (Figs. 6-10): protandrium incompletely circular; epandrium nearly trapezoid in lateral view; surstylus claviform, curved backward and acute apically; hypandrial apodeme long and parallel; gonopod columniform, about as long as aedeagus; aedeagus without apical incision, but with pair of dorsal sclerites incurved and convergent apically; aedeagal apodeme as long as aedeagus.

DISTRIBUTION: China (Yunnan).

REMARKS: The new species resembles *H. longinotata* Shi & Yang from China (Hainan) in the following characters: ocellar triangle brown; oc about as long as anterior or; arista long plumose, with longest hairs as long as height of 1st flagello-



FIGS 1-5

*Homoneura cangshanensis* sp. n. Male. (1) Body, lateral view. (2) Wing. (3) Head, dorsal view. (4) Mesoscutum, dorsal view. Female. (5) Abdomen, dorsal view.

mere; wing with similar pattern; abdomen without dark spots; surstylus claviform, curved backward and acute apically. But it can be separated from the latter by the following features: frons without dark bands; 1st flagellomere brownish; protandrium incompletely circular; aedeagus without apical incision; aedeagal apodeme as long as aedeagus. In *H. longinotata*, the frons has 2 brownish bands; the 1st flagellomere is black at apical 1/3; the protandrium is a complete circle; the apical incision of the aedeagus is deep; the aedeagal apodeme is shorter than aedeagus (Shi & Yang 2009).

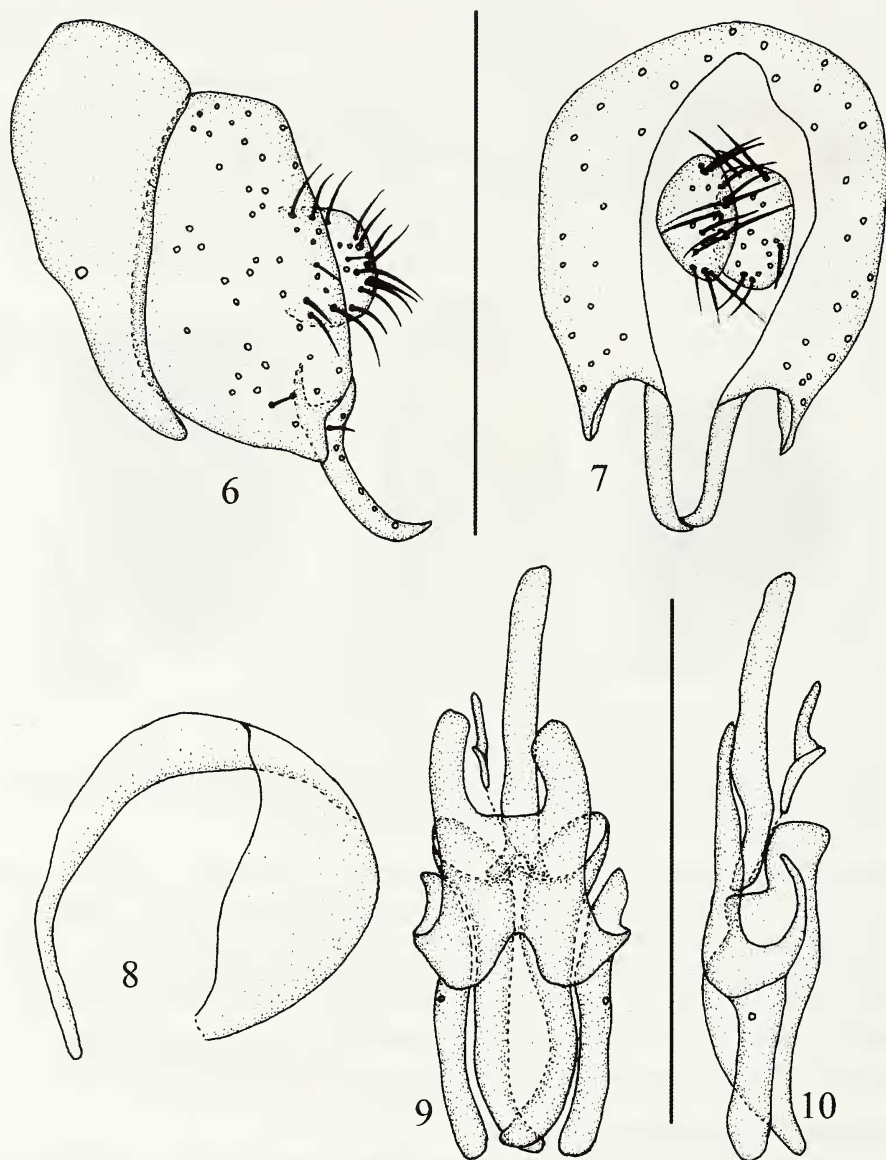
***Homoneura crispa* new. spec.**

Figs 11-20

**MATERIAL:** Holotype ♂ (CAU), CHINA, Yunnan Province: Fugong, Yaping (27°10'N, 98°45'E, 2000 m), 27. V. 2007, Xingyue Liu (CAU). – Paratypes: CHINA, Yunnan Province: 1 ♂ (MNHG), data same as holotype.

**ETYMOLOGY:** Latin, *crispa*, meaning curled, referring to the aedeagus curled apically.

**DIAGNOSIS:** Frons with 2 brown lateral bands. Wing with 5 brown spots, dark on dm-cu, r-m, preapices of  $R_{2+3}$ ,  $R_{4+5}$  and  $M_1$ ; preapical spots of  $R_{4+5}$  and  $M_1$  confluent; subcostal cell brownish. Abdominal tergites 2-6 each with a black band at posterior margin, and tergites 3-6 with a narrow black median band; protandrium



FIGS 6-10

*Homoneura cangshanensis* sp. n. Male. (6) Protandrium and epandrium, lateral view. (7) Epandrial complex, posterior view. (8) Protandrium, anterior view. (9) Aedeagal complex, ventral view. (10) Aedeagal complex, lateral view. Scale 0.5 mm.

circular; surstylus bifurcated; hypandrium Y-shaped; aedeagus curled towards dorsum and acuted apically, with pair of lateral spurs medially.

#### DESCRIPTION

*Male*: Body length 4.2-4.3 mm; wing length 4.3-4.5 mm.



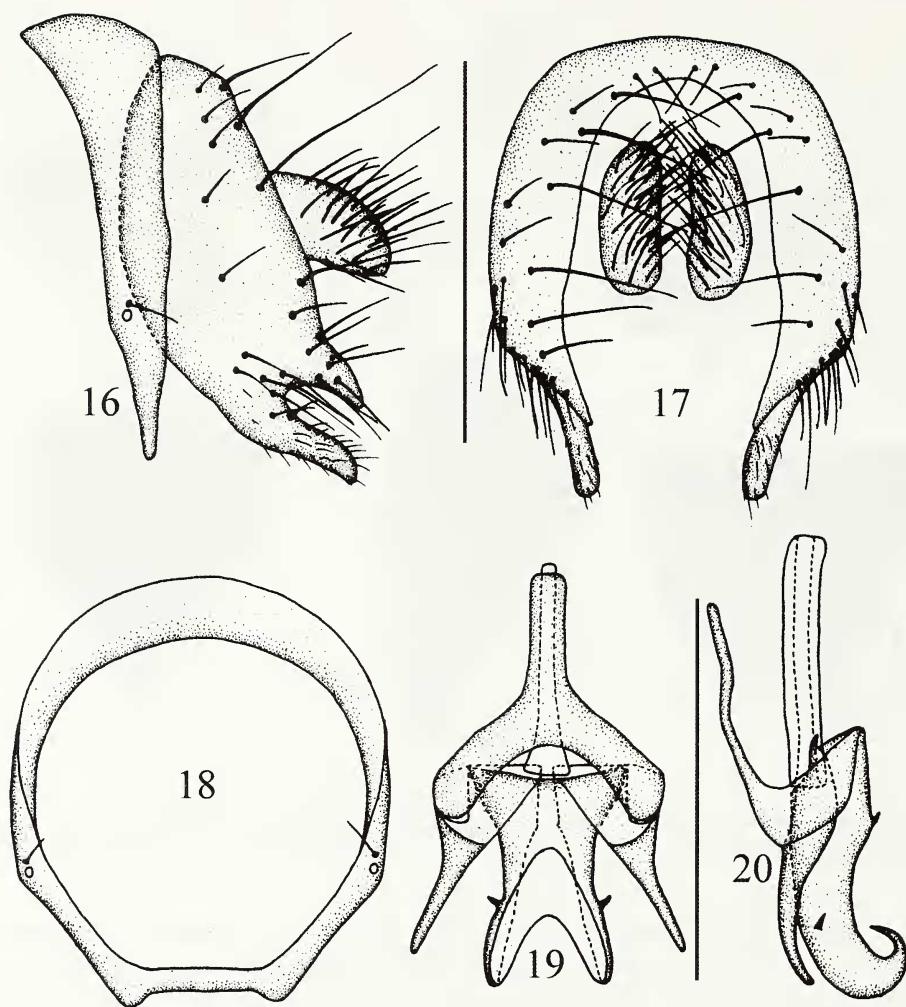


FIGS 11-15

*Homoneura crisa* sp. n. Male. (11) Body, lateral view (apical portion of abdomen removed). (12) Wing. (13) Head, dorsal view. (14) Mesoscutum, dorsal view. (15) Abdomen, dorsal view.

Head (Fig. 13) yellow. Frons about as wide as long and parallel-sided, with 2 brown lateral bands; ocellar triangle black brown; oc strong, about as long as anterior or; anterior or shorter than posterior or. Gena about 1/5 height of eye. Antenna yellow; 1st flagellomere yellow except brown one side, 1.6 times longer than high; arista black except brown basally, with longest hairs about 1/4 width of 1st flagellomere. Proboscis brownish, with blackish and yellowish hairs; palpus yellowish, with black hairs.

Thorax (Fig. 14) brownish, with grayish white pruinescence. Mesoscutum with 1 wide blackish brown median band extending to apical margin of scutellum, 0+3 dc, anterior dc close to transverse scutal suture, acr in 6 rows, prsc shorter than anterior dc. Legs yellow. Fore femur with 5 strong pv and 7 pd, ctenidium with 9-10 short bristles; fore tibia with 1 long preapical ad and 1 short apv. Mid femur with 7 a and 1 apv; mid tibia with 1 strong preapical ad and 3 strong apv. Hind femur with 1 preapical ad; hind tibia with 1 weak preapical ad and 1 short apv. Wing (Fig. 12) slightly yellow, with 5 brown spots, dark on dm-cu, r-m, preapices of  $R_{2+3}$ ,  $R_{4+5}$  and  $M_1$ ; preapical spots of  $R_{4+5}$  and  $M_1$  confluent; subcostal cell brownish; costa with 2nd (between  $R_1$  and  $R_{2+3}$ ), 3rd (between  $R_{2+3}$  and  $R_{4+5}$ ) and 4th (between  $R_{4+5}$  and  $M_1$ ) sections in proportion of 12 : 2.8 : 2.3; r-m before middle of discal cell; ultimate and penultimate



FIGS 16-20

*Homoneura crispera* sp. n. Male. (16) Protandrium and epandrium, lateral view. (17) Epandrial complex, posterior view. (18) Protandrium, anterior view. (19) Aedeagal complex, ventral view. (20) Aedeagal complex, lateral view. Scale 0.5 mm.

sections of  $M_1$  in proportion of 1.8 : 1.0; ultimate section of  $CuA_1$  about 1/8 of penultimate. Halter pale yellow.

Abdomen (Fig. 15) brown, with grayish white pruinescence; tergites 2-6 each with a black band at posterior margin, and tergites 3-6 with a narrow black median band. Male genitalia (Figs 16-20): protandrium circular, with setulae above spiracle; surstylus bifurcated, anterior one with hairs, and longer than posterior one; hypandrium Y-shaped, hypandrial apodemes not distinct, gonopod long; aedeagus curled towards dorsum and acuted apically, with pair of lateral spurs medially.

*Female*: Unknown.

DISTRIBUTION: China (Yunnan).

REMARKS: The new species resembles *H. suturalis* Yang, Zhu & Hu from China (Fujian) in the following characters: wing with similar pattern, preapical spots of  $R_{4+5}$  and  $M_1$  confluent; anterior dc close to transverse scutal suture; abdominal tergites with a black median band. But it can be separated from the latter by the following features: face without spots; mesoscutum with 1 wide blackish brown median band extending to apical margin of scutellum; subcostal cell of wing brownish; abdominal tergites 2-6 each with a black band at posterior margin. In *H. suturalis*, the face has a brown spot; the mesoscutum has no darkened bands; the subcostal cell of the wing is hyaline; abdominal tergites 2-6 each has a black band at the posterior margin (Yang, Zhu & Hu 2003).

***Homoneura semiannulata* new spec.**

Figs 21-30

MATERIAL: Holotype ♂ (CAU), CHINA, Yunnan Province: Kunming, Xishan, Erdaogou (24°58'N, 102°37'E, 1900 m), 15. IV. 2007, Hui Dong. – Paratypes: CHINA, Yunnan Province: 1 ♀ (CAU), data same as holotype. – 1 ♂ (MNHG), Kunming, Xishan (24°58'N, 102°37'E, 1900 m), 16. V. 1981, Jikun Yang; 1 ♂ (CAU), Kunming, Fengmingshan (25°38'N, 102°51'E, 2600 m), 3. X. 1987, Jinjun Du. – 1 ♂, 4 ♀♀ (CAU & MNHG), Kunming, Xishan (24°58'N, 102°37'E, 1900 m), 28. V. 2005, Xingyue Liu.

ETYMOLOGY: Latin, *semi-*, prefix meaning half + *annulata*, meaning annular, referring to the shape of the hypandrial ventral processes in the lateral view.

DIAGNOSIS: Face brownish except yellow ventral margin medially. Wing (Fig. 23) slightly yellow, with 5 brown spots, separately on r-m, dm-cu, and preapices of  $R_{2+3}$ ,  $R_{4+5}$ ,  $M_1$ , preapical spot of  $M_1$  obscure. Abdominal tergites 5-6 each with a brown median spot; protandrium incompletely circular; surstylus consisting of 2 processes; hypandrium semiannular in the lateral view, long ventral processes incurved and almost convergent; aedeagus with deep apical incision.

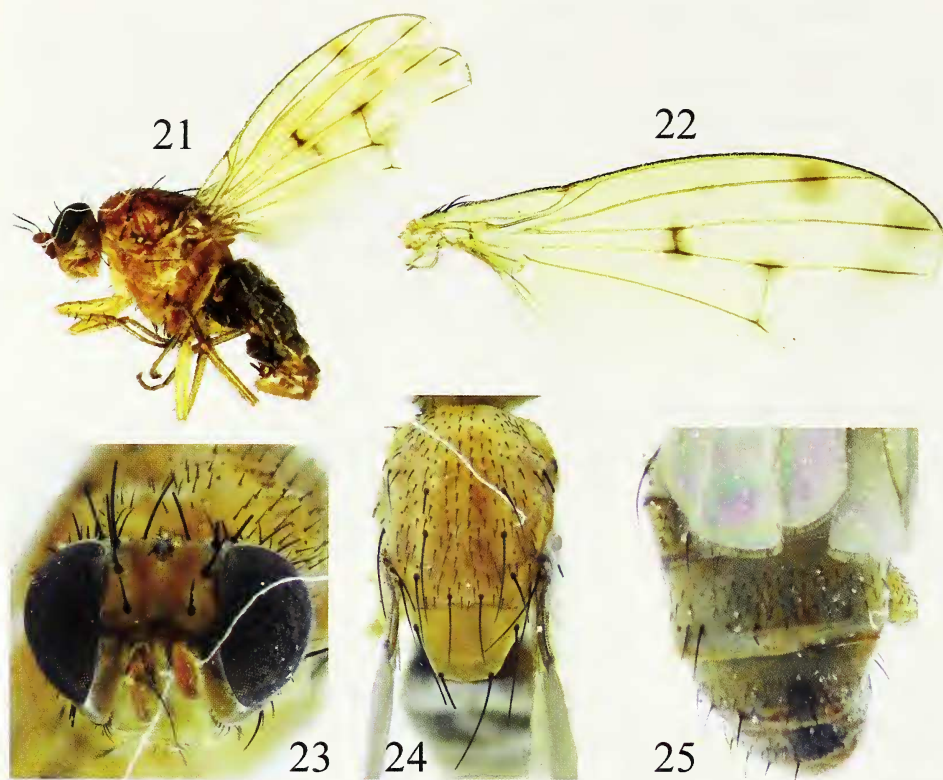
DESCRIPTION

*Male*: Body length 4.7-5.7 mm, wing length 5.0-5.7 mm.

*Female*: Body length 5.0-5.3 mm, wing length 5.3-5.5 mm.

Head (Fig. 23) yellow. Face brownish except yellow ventral margin medially. Frons slightly wider than long and parallel-sided; ocellar triangle brown; oc strong, about as long as anterior or, anterior or slightly shorter than posterior or. Gena about 1/6 height of eye. Antennal scape and pedicel yellow, 1st flagellomere brownish except yellow basally; 1st flagellomere 1.3 times longer than high; arista long plumose, blackish brown except brown basally, with longest hairs as long as height of 1st flagellomere. Proboscis yellowish brown, with yellowish and blackish hairs; palpus pale yellow with blackish hairs.

Thorax (Fig. 24) yellow with grayish white pruinescence. Mesoscutum with 0+3 dc, anterior dc clearly behind transverse scutal suture, acr in 6 somewhat irregular rows, prsc somewhat shorter than 1st post-sutural dc. Legs pale yellow. Fore femur with 4 strong pv and 6 pd, ctenidium with 10-12 short bristles; fore tibia with 1 long preapical ad and 1 short apv. Mid femur with 6 a and 1 apv; mid tibia with 1 strong preapical ad and 3 strong apv. Hind femur with 1 preapical ad; hind tibia with 1 weak preapical ad and 1 short apv. Wing (Fig. 22) slightly yellow, with 5 brown spots, sepa-



FIGS 21-25

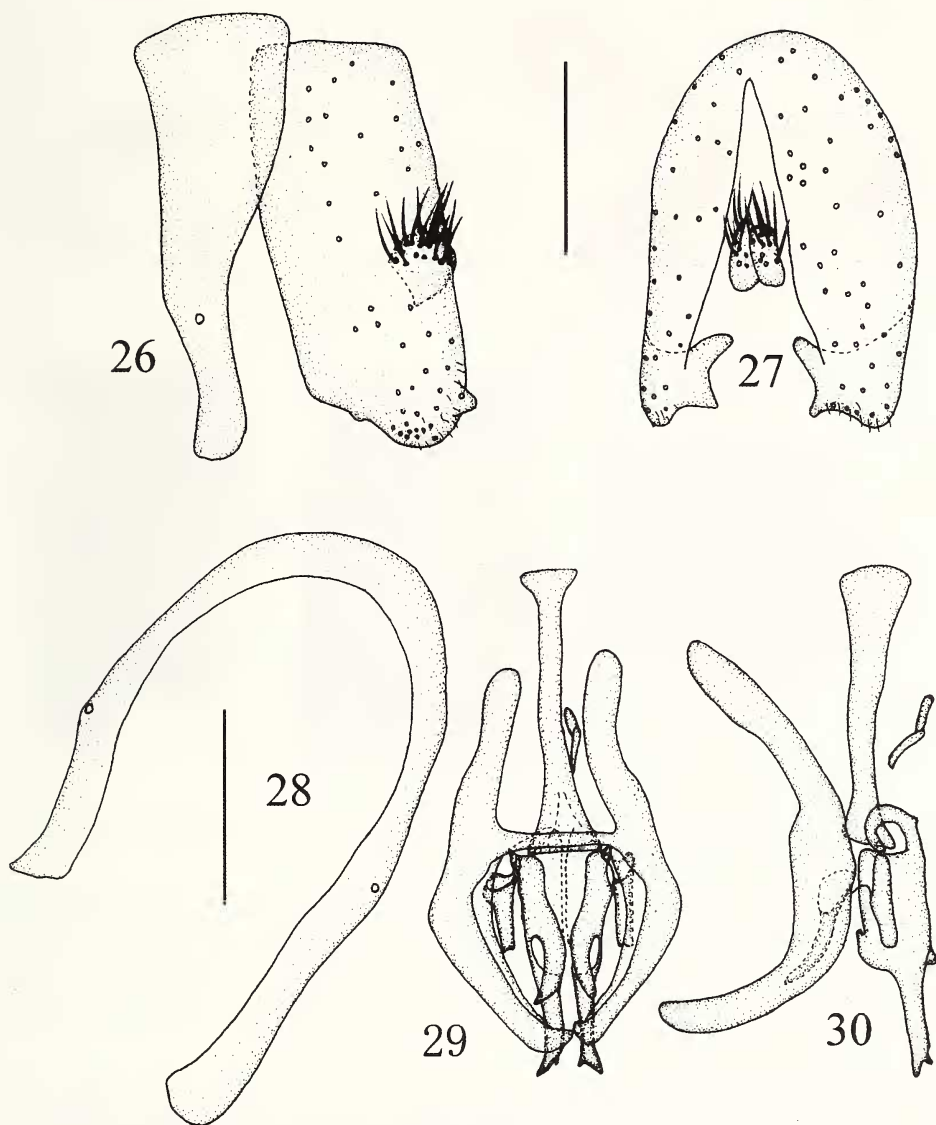
*Homoneura semiannulata* sp. n. Male. (21) Body, lateral view. (22) Wing. (23) Head, dorsal view. (24) Mesoscutum, dorsal view. (25) Abdomen, dorsal view.

rately on r-m, dm-cu, and preapices of  $R_{2+3}$ ,  $R_{4+5}$ ,  $M_1$ , preapical spot of  $M_1$  obscure; subcostal cell hyaline; costa with 2nd (between  $R_1$  and  $R_{2+3}$ ), 3rd (between  $R_{2+3}$  and  $R_{4+5}$ ) and 4th (between  $R_{4+5}$  and  $M_1$ ) sections in proportion of 2.6 : 0.8 : 0.5; r-m beyond middle of discal cell; ultimate and penultimate sections of  $M_1$  in proportion of 1.5 : 1.0; ultimate section of  $CuA_1$  about 1/8 of penultimate. Halter pale yellow.

Abdomen (Fig. 25) yellow; tergites 5-6 each with a blackish brown median spot. Male genitalia (Figs 26-30): protandrium incompletely circular; epandrium nearly oblong in lateral view, surstylus consisting of 2 small processes, anterior process at basal 1/3 of epandrium, posterior process at ventral apex of epandrium; hypandrium semiannular in the lateral view, hypandrial apodeme long and parallel, long ventral processes incurved and almost convergent; gonopod columniform, shorter than 1/2 length of aedeagus; aedeagus with deep apical incision, pair of dorsal sclerites bifurcated apically, pair of ventral sclerites curved outward and acute apically; aedeagal apodeme longer than aedeagus.

DISTRIBUTION: China (Yunnan).





FIGS 26-30

*Homoneura semiannulata* sp. n. Male. (26) Protandrium and epandrium, lateral view. (27) Epandrial complex, posterior view. (28) Protandrium, anterior view. (29) Aedeagal complex, ventral view. (30) Aedeagal complex, lateral view. Scale 0.5 mm.

REMARKS: The new species resembles *H. haejuana* Sasakawa & Kozánek from North Korea in the following characters: frons slightly wider than long; ocellar triangle brown; wing with similar pattern. But it can be separated from the latter by the following features: face brownish except yellow on ventral margin medially; abdominal tergites 5-6 each with a blackish brown median spot; protandrium incompletely



FIGS 31-35

*Homoneura trisurstylata* sp. n. male. (31) Body, lateral view. (32) Wing. (33) Head, dorsal view. (34) Mesoscutum, dorsal view. (35) Abdomen, dorsal view.

circular; surstylus consisting of 2 small processes; hypandrium semiannular in the lateral view. In *H. haejuana*, the face is entirely yellow; the abdominal tergites 3-6 each has a brown median longitudinal band; the protandrium is a complete circle; the surstylus has a long ungulate process; the hypandrium is not semiannular in the lateral view (Sasakawa & Kozánek 1995).

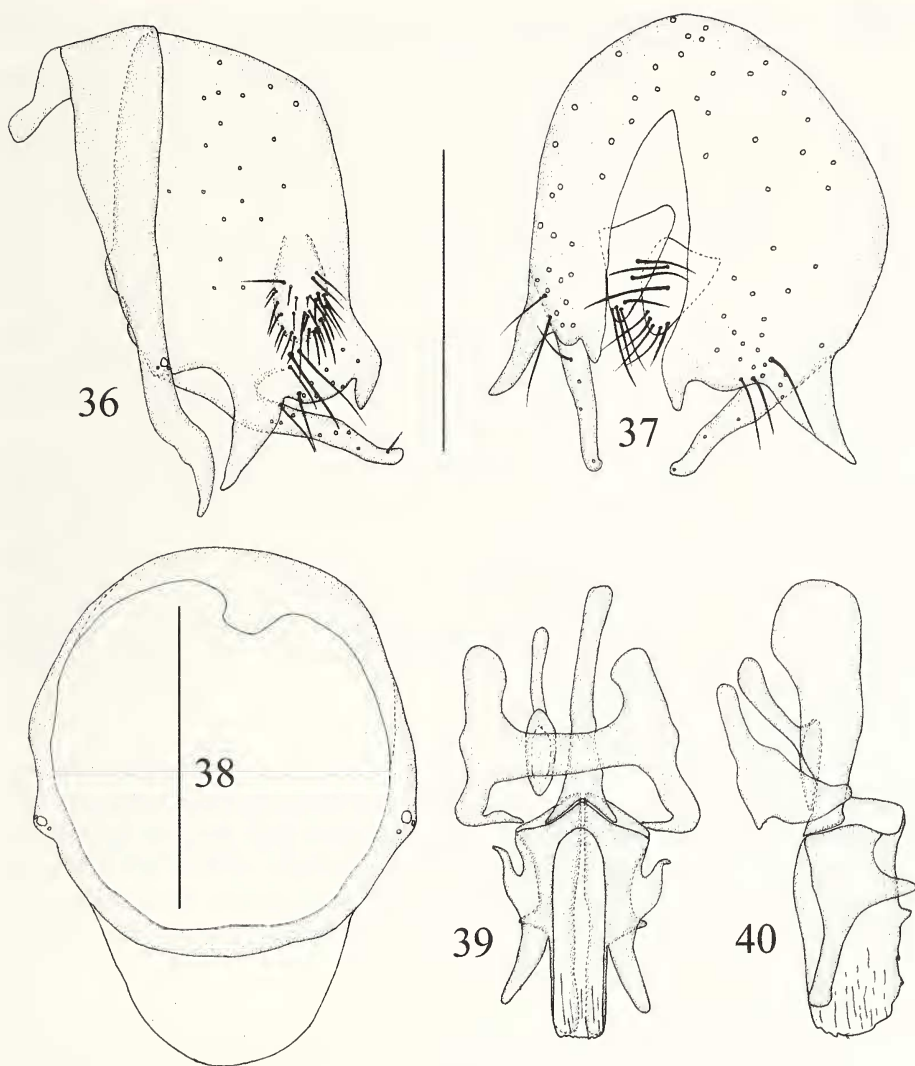
***Homoneura trisurstylata* new spec.**

Figs 31-40

**MATERIAL:** Holotype ♂ (CAU), CHINA, Yunnan Province: Xishuangbanna, Menglun, Lushilin (21°54'N, 101°16'E, 600 m), 5. V. 2009, Tingting Zhang. – Paratypes: CHINA, Yunnan Province: 1 ♂, 1 ♀ (MNHG), Xishuangbanna, Menglun, Lushilin (21°54'N, 101°16'E, 600 m), 21. IV. 2007, Wenliang Li. – 1 ♀ (CAU), Xishuangbanna, Menglun, Lushilin (21°54'N, 101°16'E, 600 m), 21. IV. 2007, Hui Dong.

**ETYMOLOGY:** Latin, *tri-*, prefix meaning three + *surstyla*, meaning surstylus, referring to the surstylus consisting of 3 processes.

**DIAGNOSIS:** Antenna yellow except 1st flagellomere blackish brown at apical 1/3. Wing with 5 brown spots, separately on r-m, dm-cu, preapices of  $R_{2+3}$ ,  $M_1$ , and apex of  $R_{4+5}$ , preapical spot of  $M_1$  obscure. Protandrium circular; surstylus consisting of 3 processes; hypandrium H-shaped.



FIGS 36-40

*Homoneura trisurstylata* sp. n. male. (36) Protandrium and epandrium, lateral view. (37) Epandrial complex, posterior view. (38) Protandrium, anterior view. (39) Aedeagal complex, ventral view. (40) Aedeagal complex, lateral view. Scale 0.5 mm.

#### DESCRIPTION

*Male*: Body length 4.8-5.1 mm, wing length 4.6-4.8 mm.

*Female*: Body length 4.3-4.6 mm, wing length 4.5-4.6 mm.

Head (Fig. 33) yellow. Frons slightly wider than long and parallel-sided; ocellar triangle brown; oc strong, about as long as anterior or, anterior or slightly shorter than posterior or. Gena about 1/7 height of eye. Antenna yellow except 1st flagellomere blackish brown at apical 1/3; 1st flagellomere 1.4 times longer than high; arista long

plumose, with longest hairs longer than height of 1st flagellomere. Proboscis yellowish brown, with yellowish and blackish hairs; palpus pale yellow with blackish hairs.

Thorax (Fig. 34) yellow with grayish white pruinescence. Mesoscutum with 0+3 dc, anterior dc clearly behind transverse scutal suture, acr in 10 somewhat irregular rows, prsc somewhat shorter than 1st post-sutural dc. Legs pale yellow. Fore femur with 4 strong pv and 5 pd, ctenidium with 12-17 short bristles; fore tibia with 1 long preapical ad and 1 short apv. Mid femur with 6 a and 1 apv; mid tibia with 1 strong preapical ad and 3 strong apv. Hind femur with 1 preapical ad; hind tibia with 1 weak preapical ad and 1 short apv. Wing (Fig. 32) slightly yellow, with 5 brown spots, separately on r-m, dm-cu, preapices of  $R_{2+3}$ ,  $M_1$ , and apex of  $R_{4+5}$ , preapical spot of  $M_1$  obscure; subcostal cell hyaline; costa with 2nd (between  $R_1$  and  $R_{2+3}$ ), 3rd (between  $R_{2+3}$  and  $R_{4+5}$ ) and 4th (between  $R_{4+5}$  and  $M_1$ ) sections in proportion of 2.5 : 0.7 : 0.5; r-m at middle of discal cell; ultimate and penultimate sections of  $M_1$  in proportion of 1.5 : 1.0; ultimate section of  $CuA_1$  about 1/8 of penultimate. Halter pale yellow.

Abdomen (Fig. 35) yellow. Male genitalia (Figs 36-40): protandrium circular; epandrium nearly oblong in lateral view, surstylus consisting of 3 processes, in the lateral view, anterior process claviform and recurved, median process triangulum and curved forward, posterior process similar as median process in shape but smaller; hypandrium H-shaped, hypandrial apodeme long and parallel; gonopod columniform, shorter than aedeagus; aedeagus without apical incision, dorsal sclerites with pair of trochiformis processes laterally, and with a small acute process preapically; aedeagal apodeme about as long as aedeagus.

DISTRIBUTION: China (Yunnan).

REMARKS: The new species resembles *H. quiquenotata* (de Meijere) from Java in the following characters: 1st flagellomere blackish brown apically; wing with similar pattern; protandrium circular. But it can be separated from the latter by the following features: surstylus consisting of 3 processes; aedeagus without apical incision; aedeagal apodeme about as long as aedeagus. In *H. quiquenotata*, the surstylus has 1 process; the aedeagus has a deep apical incision; the aedeagal apodeme is shorter than the aedeagus (Sasakawa, 1992).

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